

NASA TECH BRIEF

Goddard Space Flight Center



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Optical Design Computer Program: LENS II

The problem:

The evaluation of optical lens designs requires the consideration of several complex factors.

The solution:

A differential-correction lens design program (LENS II) has been written which evaluates optical lens design.

How it's done:

The criterion which the program uses for the evaluation of optical lens design progress is basically a path length criterion. Hamilton's angle-characteristic function is used in the development of the set of image-defect items used by the program. The coordinate systems, in terms of which the angle characteristic is represented, have their origins at the center of the entrance pupil for the object space coordinates and at the Gaussian image point for the image space coordinates.

The function which specifies the performance of the lens relative to image quality incorporates the angle characteristic, which is a function of aperture coordinates, field coordinate, and wavelength. An

integral is taken over the vignetted aperture (a two-dimensional region), the field, and the wavelength interval. This function has the requisite mathematical properties (i.e., a sum of squares) of a proper defect function for an automatic lens design program and is closely related to the Strehl definition of image quality. LENS II is considered a powerful differential-correction lens design program.

Notes:

1. The program is written in FORTRAN IV for the IBM 360 H compiler and may be compiled under option 0 or 2. Option 2 is recommended. The G-level compiler may also be used.
2. Inquiries concerning this program should be directed to:

COSMIC
112 Barrow Hall
University of Georgia
Athens, Georgia 30601
Reference: GSC-11951

Source: Computer Library
(GSC-11951)

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